

# **DISPLAY PACK FOR TOOL ASSEMBLIES**

## **BACKGROUND OF THE INVENTION**

### 1. Field of the Invention

The present invention relates to a display pack, and more  
5 particularly to a display pack for receiving and supporting and  
locking and displaying tool assemblies.

### 2. Description of the Prior Art

Various kinds of typical display packs have been developed for  
receiving and supporting and locking and displaying tool members,  
10 such as wrenches, screw drivers, plier devices, etc., and comprise  
one or more retaining clips for engaging onto and thus for securing  
and locking the tool members to the display packs.

For example, U.S. Patent No. 5,501,330 to Betts discloses one  
of the typical display packs and comprises two retaining clips for  
15 engaging onto and for securing and locking the tool members to the  
display packs.

U.S. Patent No. 6,164,463 to Lee, and U.S. Patent No.  
6,315,119 to Lee also disclose two similar typical display packs  
each including a single retaining clip or the like to engage with and  
20 to secure and lock the tool members to the display packs.

U.S. Patent No. 5,785,174 to Chow discloses another typical  
display pack including a single retaining clip or the like to engage  
with and to secure and lock the tool members to the display packs,  
and arranged to allow the tool member to be rotated or tested  
25 relative to the tool packs.

However, the typical display packs may be provided for  
supporting and displaying large tool members, such as wrenches,

screw drivers, plier devices, etc., and may not be used to receive and support and lock and display smaller tool elements, such as screw driver bits, sockets, or the like.

The present invention has arisen to mitigate and/or obviate the  
5 afore-described disadvantages of the conventional display packs.

### **SUMMARY OF THE INVENTION**

The primary objective of the present invention is to provide a display pack for receiving and supporting and locking and displaying tool assemblies, including greater tool members and  
10 smaller tool elements.

In accordance with one aspect of the invention, there is provided a display pack comprising a plate for supporting and retaining a greater tool member thereon, such as wrenches, screw drivers, plier devices, etc.. The plate includes a plurality of cavities  
15 formed therein, a plurality of smaller tool elements, such as screw driver bits, sockets, or the like, received in the cavities of the plate, and a retaining device for retaining the smaller tool elements in the cavities of the plate.

The retaining device includes at least one bar for limiting a  
20 movement of the tool elements relative to the plate, and for retaining the tool elements in the cavities of the plate. The bar includes a plurality of apertures formed therein, to partially receive the tool elements, and to retain the tool elements in the cavities of the plate. The retaining device further includes a second bar for  
25 limiting a movement of the tool elements relative to the plate, and for retaining the tool elements in the cavities of the plate.

The retaining device further includes at least one link coupled

between the second bar and the bar. The plate includes at least one depression formed therein, to receive the link of the retaining device. The second bar includes a plurality of apertures formed therein, to partially receive the tool elements, and to retain the tool elements in the cavities of the plate.

A second retaining device may further be provided and attached to the plate, for locking the tool member to the plate. The second retaining device includes a clip for engaging with the tool member, and two catches extended from the clip, and engaged with the plate, to secure the clip of the second retaining device to the plate. Each of the catches of the second retaining device includes an enlarged head provided thereon to engage with the plate, and to secure the clip of the second retaining device to the plate.

The plate includes an opening formed therein for receiving the tool member. The plate includes at least one pair of retaining fingers extended therefrom, for engaging with and for retaining the tool member to the plate. The plate includes at least one seat extended therefrom, for engaging with and for retaining the tool member to the plate. The seat of the plate includes a curved recess formed therein, for receiving the tool member.

The plate includes a plurality of blocks extended therefrom, and having the cavities formed therein, for receiving the tool elements in the cavities of the blocks. The blocks are formed together as one-integral piece. The blocks are extended downwardly and/or upwardly beyond the plate. The plate includes a bulge extended therefrom, for engaging with and for retaining the tool member to the plate.

Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

5                    **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a perspective view of a display pack in accordance with the present invention;

FIG. 2 is an exploded view of the display pack;

FIG. 3 is a top plan view of the display pack;

10            FIGS. 4, 5 are cross sectional views of the display pack, taken along lines 4-4 and 5-5 of FIG. 3 respectively, and

FIG. 6 is a perspective view illustrating the operation of the display pack.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

15            Referring to the drawings, and initially to FIGS. 1-5, a display pack in accordance with the present invention comprises a sheet or card or a plate 10 for receiving and supporting and locking and displaying various tool members 70, such as wrenches, screw drivers, plier devices, etc.

20            The plate 10 includes an engaging hole 11 formed therein for such as hanging and displaying purposes, and includes a bulge 12 formed or provided thereon for applying marks 13 thereon, for example, and includes a shoulder 14 formed or defined below the bulge 12 for engaging with the tool members 70 (FIG. 6).

25            The plate 10 includes an opening 15 formed therein, and formed or defined between two legs 151, for receiving such as a swelling 71 of a handle 72 of the tool member 70 which includes a

reduced neck portion 73 formed between the swelling 71 and the handle 72 of the tool member 70, and which includes a driving shank 74 extended from the handle 72. The driving shank 74 of the tool member 70 may be engaged with the shoulder 14 of the bulge 12 or of the plate 10 (FIG. 6), to anchor the tool member 70 to the plate 10.

The plate 10 includes one or more pairs of retaining fingers 16 extended therefrom, for engaging with the driving shank 74 of the tool member 70 (FIG. 6), and thus for further anchoring and retaining the tool member 70 to the plate 10. It is preferable that the plate 10 includes one or more seats 17 extended therefrom, and each having a curved recess 18 formed therein for receiving the driving shank 74 of the tool member 70 (FIG. 5), and thus for further anchoring and retaining the tool member 70 to the plate 10.

A retaining device 20 includes a clip 21 for engaging into the reduced neck portion 73 of the tool member 70, and which includes two catches 22 extended from the ends thereof, and engaged into orifices 19 that are formed in the legs 151 of the plate 10, to further anchor and lock and retain the tool member 70 to the plate 10. Each of the catches 22 includes an enlarged head 23 formed thereon for engaging with the legs 151 of the plate 10 (FIG. 4), to secure or lock the clip 21 of the retaining device 20 to the plate 10.

The plate 10 further includes one or more blocks 30 extended therefrom, such as extended from the side portions thereof, and extended upwardly and downwardly beyond the plate 10. The blocks 30 may be secured or formed together as one-integral piece, and may also be secured or formed together with the plate 10 as

one-integral piece, by such as molding or mold-injection processes, for example.

Each of the blocks 30 includes a cavity 31 formed therein, to receiving smaller tool elements 77, such as sockets (not shown), screw driver bits 77, or the like. It is preferable that each of the blocks 30 includes a bottom wall 32 formed therein (FIG. 5), to define the cavity 31 thereof, and thus to stably receive and retain the smaller tool elements 77 within the cavities 31 of the blocks 30. The plate 10 further includes one or more depressions 33 formed therein.

Another retaining device 40 is further provided for anchoring and retaining the smaller tool elements 77 to the blocks 30 of the plate 10, and includes one or more bars 41 for engaging onto and/or for limiting the movement of the smaller tool elements 77 relative to the blocks 30 of the plate 10, and thus to anchor and retain the smaller tool elements 77 to the blocks 30 of the plate 10.

It is preferable that each of the bars 41 of the retaining device 40 includes one or more apertures 42 formed therein, to partially receive the smaller tool elements 77, and thus to anchor and retain the smaller tool elements 77 to the blocks 30 of the plate 10. As shown in FIG. 5, the inner diameters of the apertures 42 of the bars 41 of the retaining device 40 are preferably no greater than the outer diameters of the smaller tool elements 77, in order to prevent the smaller tool elements 77 from being easily moved out through the apertures 42 of the bars 41 of the retaining device 40.

It is preferable that the inner diameters of the apertures 42 of the bars 41 of the retaining device 40 are equals to or slightly smaller than the outer diameters of the smaller tool elements 77, to

allow the smaller tool elements 77 to be moved out or disengaged or pulled out from the apertures 42 of the bars 41 of the retaining device 40 by force only.

The retaining device 40 further includes one or more belts or  
5 links 43 formed and coupled between the bars 41, and preferably curved downwardly, and preferably engaged into or received in the depressions 33 of the plate 10 (FIG. 5). The driving shank 74 of the tool member 70 may be engaged onto the links 43 of the retaining device 40, to anchor and retain and lock the retaining device 40 to  
10 the plate 10.

In operation, as shown in FIG. 6, the greater tool members 70 may be secured and locked to the plate 10 with the retaining device 20, and/or the retaining fingers 16 of the plate 10, and/or the seats 17 of the plate 10, and/or the bulge 12 of the plate 10, and the  
15 smaller tool elements 77 may be secured and locked to the blocks 30 of the plate 10 with the other retaining device 40.

Accordingly, the display pack in accordance with the present invention may be used for receiving and supporting and locking and displaying tool assemblies, including greater tool members and  
20 smaller tool elements.

Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination  
25 and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.